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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,531	12/12/2003	Barrett E. Cole	H0006044-0760(1100.123210	2695

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EXAMINER

HODGES, MATTHEW P

ART UNIT	PAPER NUMBER
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2879

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/735,531

Applicant(s)

COLE ET AL.

Examiner

Matt P. Hodges

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2006.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12, 20-27 and 29-31 is/are pending in the application.
- 4a) Of the above claim(s) 13-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 20-27 and 29-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eden et al. (US 2004/0100194 A1) in view of Cheng et al. (Non-Patent Literature cited as document AA).

Regarding claim 1, Eden discloses (see figure 3) a UV detector including a first wafer having a cathode (304), second wafer (308) with a chamber, and a third wafer (306) having an anode. The second and third wafers are composed of Silica. (Paragraphs 0062 and 0068). The third wafer is composed of silicon. (Paragraph 0056). Eden does not appear to specify the use of eutectic bonding between the various wafers, however Cheng, in the same field of endeavor, discloses the use of eutectic bonding between silica, glass, silicon, or other like materials. (Pages 1 and 2). The use of eutectic bonding advantageously allows for faster stronger bonds and a lower manufacturing temperature. (Abstract). Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the use of eutectic bonding as disclosed by Cheng to bond the wafer layers disclosed by Eden in order to advantageously improve manufacturing of the device.

Regarding claim 2, Eden further discloses that the chamber is sealed. (Paragraph 0045).

Regarding claim 3, Eden further discloses the use of a transparent third wafer. (Paragraph 0068).

Regarding claim 4, Eden further discloses the use of a Neon gas inside the chamber. (Paragraph 0045).

Claims 5-12, 20-27, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eden et al. (US 2004/0100194 A1) in view of Cheng et al. (Non-Patent Literature cited as document AA) and further in view of Axmark et al. (US 3,732,452)

Regarding claim 5, Eden in view of Cheng discloses the claimed invention and further discloses the selection of a gas mixture being dependent upon the desired sensitivity. (Paragraph 0051). However Eden does not appear to specify the use of a gas mixture including both H₂ and Neon. However, Axmark, in the same field of endeavor, discloses the use of a Hydrogen-Neon fill for use in a UV detector where at least 50% of the fill is Neon. (Column 2 lines 55-65). The use of hydrogen inside the fill advantageously controls the electrical properties of the chamber and leads to greater device reliability. (Column 5 lines 15-20). Thus, it would have been obvious to one having ordinary skills in the art at the time the invention was made to have included Hydrogen into the Neon gas mixture as taught by Axmark into the device as disclosed by Eden in view of Cheng in order to advantageously improve device reliability.

Regarding claim 6, Eden further discloses the use of a chamber 60 microns thick. (Paragraph 0009).

Regarding claims 7 and 8, Eden in view of Cheng and further in view of Axmark disclose the device having 3 wafers all bonded by Eutectic bonding. (See rejection of claim 1 above).

Regarding claim 9, Eden in view of Cheng and further in view of Axmark discloses the device as claimed and alternatively discloses the third wafer being composed of an insulator covered with a semiconducting active region. (Paragraph 0055). Eden does specify the composition of the insulator, however it is well understood in the art to use silica wafers coated with silicon when it is desired to form a silicon layer on an insulating surface. The selection of silica as the insulating material advantageously provides a greater adhesion and ease of manufacturing in wafer construction. Thus, it would have been obvious to one having ordinary skills in the art at the time the invention was made to have used silica as the composition of the insulating wafer into the device as disclosed by Eden in view of Cheng and further in view of Axmark in order to advantageously provide a greater adhesion and ease of manufacturing in wafer construction.

Regarding claims 10-12, Eden further discloses the use of conductors on both the first and third substrates to form the cathode and anodes respectively. Further the anode is formed of a conductive grid formed on a silica layer. (Paragraph 0068). The anode and cathode are connected to external power supplies through connections. Further the conductive material used for both the anode and cathode are metals. (Paragraphs 0055 and 0065).

Regarding claims 20-23, claims 20-23 are rejected for the reasons cited in the rejection of claims 1 and 5 above.

Regarding claim 24, Eden further discloses a cathode located in a first opening of the second wafer and an anode grid located in a second opening of the second wafer. (See figure 4b).

Regarding claim 25, claim 25 is rejected for the reasons listed in the rejection of claim 3 above.

Regarding claim 26, claim 26 is rejected for the reasons listed in the rejection of claim 4 above.

Regarding claim 27, the use of electrical connections to the cathode and anode are inherent in the operation of the device.

Regarding claims 29 and 30, claims 29 and 30 are rejected for the same reasons as cited in the rejection of claims 4 and 5 above.

Regarding claim 31, Eden further discloses the use of multiple chambers and detectors on a single wafer. (Paragraph 0063).

Regarding claim 32, the cutting of a wafer to select individual detectors is inherent to the process of manufacture of a detector device using large wafers.

Response to Arguments

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Specifically regarding applicant's assertion that the Wang reference does not teach the use of Eutectic bonding, the examiner respectfully disagrees. The examiner interprets the language cited as indicating alternative known processes for the bonding of the substrates. Eutectic bonding was known at this time for the bonding of MEMS substrates as is evident from the other cited art. However this rejection has been withdrawn at this time in light of the amendment and current rejection that satisfies all claims.

Regarding applicant's assertion that the properties of Hydrogen in a UV detector are not obvious in the art, a secondary reference has been provided to indicate the advantageous properties of using Hydrogen gas in a fill with Neon.

All other arguments are moot in view of the new grounds of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

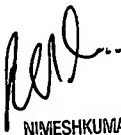
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matt P Hodges whose telephone number is (571) 272-2454. The examiner can normally be reached on 7:30 AM to 4:00 PM M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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